20. The improvement as defined in claim 12, wherein said at least one electronic component is a resistor, a capacitor or a ring resonator.

REMARKS

The drawings were objected to because Fig. 1 was not labeled "Prior Art". A sketch of Fig. 1 with changes marked in red accompanies this amendment. The term "Prior Art" has been added to Fig. 1. Approval of the changes in Fig. 1 and withdrawal of the objection to the drawing is thus respectfully requested.

The form of the claims was objected to because of the presence of drawing reference characters. Applicants have drafted a new set of claims in Jepson or Improvement format to particularly point out and distinctly claim the features of the inventive improvement in the claimed device. These new claims do not contain any drawing reference characters, which are indeed unnecessary. The preamble of claim 1 only includes features of the prior art devices.

Because of the new claims without reference characters, withdrawal of the objection to the claims is respectfully requested.

Claims 1 to 11 were rejected under 35 U.S.C. 102 (b) as anticipated by Cerniglia.

Claims 12 to 20 have been added and rejected claims 1 to 11 have been canceled, obviating their rejection based on Cerniglia. Claim 12 is drafted in

Jepson or improvement format and has been drafted so that it is patentably distiguishable from the disclosures in Cerniglia.

The new main claim 12 uses the term "thin-film technology" instead of "thin-layer technology". This is an important difference because "thin-film technology" is a term of the electronic arts which requires that the thin-film is provided with an electrically-insulating substrate, which is not present in the structure disclosed by Cerniglia. Also the improvement, according to claim 12, is made in a device comprising the substrate and the layer sequence built on the substrate. Thus by making this wording change it would be understood by one skilled in the electronic arts that the substrate of the layer sequence necessarily is an electric insulator, although the claim does not explicitly so state.

The change from "thin-layer technology" to "thin-film technology" has basis in the current specification for two reasons: first the term "thin-film technology" is used in the background section on pages 2 and 3. The first part of the "summary section" on page 4 does not use either term and clearly is describing an improvement in the layer sequence made according to the methods described in the "background section". Second the priority document is incorporated by reference according to paragraph 3 on page 8 of the U.S. specification and claim 1 of the priority document uses the term "dünnschicht" which was translated as "thin-layer" in claim 1. However a copy of a German-English Technical Dictionary is being filed with an Information Disclosure Statement showing that the correct translation of the term "dünnschicht" in the electronic arts is "thin-film". This supports the change in the new independent main claim from "thin-layer" to "thin-

film".

In addition, a copy of the IEEE dictionary entry for "thin-film technology" has been filed to show that thin-film technology always involves a film on a substrate, which is an electrical insulator, i.e. a non-conducting material. However the substrate 10 shown in Fig. 2 of Cerniglia and described in column 3, from about lines 40 to 50 is a semi-conducting material, a silicon wafer, not a non-conductor.

Also new claim 12 avoids Cerniglia because the relative thickness of the conductive layers is not adjusted or determined by a two-stage electroplating process as disclosed in column 5 of this reference. Instead it is determined or adjusted by means of a laser erosion technique in which conductive material is "blasted away" by the laser, which indeed produces extraneous contaminant conductive deposits, which are not produced during the two-stage electroplating. By at least partially eliminating reinforcing material in the regions of the conductive layers, which are adjusted, the amount of the extraneous contaminant conductive material is reduced or minimized (see page 5 of applicants' specification). The extraneous contaminant conductive deposits are <u>not</u> present at all in the device of Cerniglia, but the device of Cernigila is not adjusted in its electrical properties by means of the laser erosion technique.

Basis for the features included in new claim 12 regarding the contaminant conductive deposits appears in the last paragraph on page 3, the first and fourth paragraphs of page 4 and the full paragraph starting on line 5 of page 5 of applicants' originally filed specification.

In order for a prior art reference to anticipate a claimed invention under 35 U.S.C. 102 (b) *each and every element* must appear in the reference, either expressly or inherently." See M.P.E.P. 2131 and judicial decisions cited therein, e.g. ***In re Bond***, 15 U.S.P.Q. 2nd 1566 (Fed Cir 1990).

In the case of the instant claim 12, Cerniglia (1) does not disclose or suggest an improved device including an insulator substrate (as required in thin-film technology) and layer sequence having electrical properties adjusted by laser erosion methods and (2) an improved device including the layer sequence and extraneous conductive deposits that are produced by the laser erosion method which would not be present when the layers of different thickness are produced solely by electroplating.

Also the problem that the invention is trying to solve is never mentioned and would not be present in the device of Cerniglia. For that reason its solution cannot be obvious from the disclosure in Cerniglia.

For the foregoing reasons it is respectfully submitted that new claims 12 to 20 should not be rejected under 35 U.S.C. 102 (b) as anticipated by, or under 35 U.S.C. 103 (a) as obvious from, the Cerniglia patent.

Claims 1 to 2 and 7 to 9 were rejected under 35 U.S.C. 102 (b) as anticipated by Lifshin.

Claims 1 to 11 have been canceled, obviating their rejection under 35 U.S.C. 102 (b) based on Lifshin. New independent claim 12 has been drafted so that it is patentably distinguishable from the disclosures in Lifshin.

Lifshin only discloses a raw printed circuit board without components on it. Lifshin does not disclose the construction of any structures on the board, such as electronic components on the printed circuit board.

The product disclosed in Lifshin is a circuit board having a surface, which is completely covered by a conductive layer (claims 1 and 6). While Lifshin does disclose projections having dendrites, these serve to anchor the copper layer into the underlying substrate. The positions of the projections are not predetermined and can therefore bear no relationship to any structures, which may subsequently be constructed on the board. Column 5, lines 10-12, refers to the projections being highly irregular in their location.

Lifshin cannot anticipate the new claim 12 or any of the other new claims under 35 U.S.C. 102 (b).

First, the new improvement claim 12 claims an improved substrate and layer sequence built on said substrate in thin-film technology, which includes at least one electronic component. Since Lifshin does not include any electronic components on his circuit board Lifshin cannot anticipate the new claim 12.

The present specification provides sufficient basis for claiming the at least one electronic component as part of the device. For example, see the second paragraph of page 8 for a general statement regarding the presence of an electronic component in general. Also see the last paragraph on page 3 for a general statement of what is improved. Of course the examples of Figs. 5 to 7, among others, show particular electronic components which comprise or are

structured in one or more layers of the layer sequence and are adjusted by the laser erosion technique.

Second, contaminant conductive deposits produced by laser erosion are not part of the claimed device in the Lifshin reference, which is only a circuit board with a conductive layer or cladding. The claimed device of claim 12 indeed claims a substrate plus layer sequence which includes these extraneous contaminant conductive deposits, which are not produced during any electroplating or sputtering technique. Basis for the features included in new claim 12 regarding the contaminant conductive deposits appear in several locations in applicants' specification. Specifically they appear in the last paragraph on page 3, the first and fourth paragraphs of page 4 and the full paragraph starting on line 5 of page 5 of applicants' originally filed specification.

In order for a prior art reference to anticipate a claimed invention under 35 U.S.C. 102 (b) *each and every element* must appear in the reference, either expressly or inherently." See M.P.E.P. 2131 and judicial decisions cited therein, e.g. ***In re Bond***, 15 U.S.P.Q. 2nd 1566 (Fed Cir 1990).

In the case of the instant claim 12, Lifshin does not disclose the improved device claimed in claim 12 with the (1) at least one electronic component which is adjusted by means of laser erosion and (2) the extraneous conductive deposits that are produced by the laser erosion method which would not be present when the layers of different thickness are produced solely by electroplating and/or sputtering.

Also the problem that the invention is trying to solve is never mentioned

and would not be present in the device of Lifshin. For that reason its solution cannot be obvious from the disclosure in Lifshin.

For the foregoing reasons it is respectfully submitted that new claims 12 to 20 should not be rejected under 35 U.S.C. 102 (b) as anticipated by, or under 35 U.S.C. 103 (a) as obvious from, Lifsihn.

Claims 1 to 2 and 7 to 9 were rejected under 35 U.S.C. 102 (b) as anticipated by Tabuchi.

Claims 1 to 11 have been canceled, obviating their rejection under 35 U.S.C. 102 (b) based on Tabuchi. New independent claim 12 has been drafted so that it is patentably distinguishable from the disclosures in Tabuchi.

Tabuchi discloses a stamper for optical discs and a method of making it. Tabuchi does not disclose that the stamper includes any electronic components.

The stamper of Tabuchi has a solid metal structure having a plurality of projecting portions, which will produce pits on an optical disc during a stamping operation. Intermediate structures are also disclosed that are formed during the method of making the stamper. These intermediate structures include a body with a glass substrate 1, a photresist layer 2 and a metal structured layer 4a on the photoresist layer. The metal structured layer 4a eventually becomes the stamper after separation, but does not have any structure itself, except for the projecting portions.

First, the new improvement claim 12 claims an improved substrate and layer sequence built on said substrate in thin-film technology, which includes at

least one electronic component. Since Tabuchi does not include any electronic components on his stamper or any of the intermediate bodies used in the method of making it, Tabuchi cannot anticipate the new claim 12.

The present specification provides sufficient basis for claiming the at least one electronic component as part of the device, as noted above. For example, see the second paragraph of page 8 for a general statement regarding the presence of an electronic component in general.

Second, contaminant conductive deposits produced by laser erosion are not part of the claimed device in the Tabuchi reference. The claimed device of claim 12 indeed claims a substrate plus layer sequence which includes these extraneous contaminant conductive deposits, which are not produced during any electroplating or sputtering technique. Basis for the features included in new claim 12 regarding the contaminant conductive deposits appear in several locations in applicants' specification, as noted above, with respect to the other references.

In order for a prior art reference to anticipate a claimed invention under 35 U.S.C. 102 (b) *each and every element* must appear in the reference, either expressly or inherently." See M.P.E.P. 2131 and judicial decisions cited therein, e.g. ***In re Bond***, 15 U.S.P.Q. 2nd 1566 (Fed. Cir. 1990).

In the case of the instant claim 12, Tabuchi does not disclose the improved device claimed in claim 12 with the (1) at least one electronic component which is adjusted by means of laser erosion and (2) the extraneous conductive deposits that are produced by the laser erosion method, which would

not be present when the layers of different thickness are produced solely by electroplating and/or sputtering.

Also the problem that the invention is trying to solve is never mentioned and would not be present in the device of Tabuchi. For that reason its solution cannot be obvious from the disclosure in Tabuchi.

Furthermore Tabuchi et al is nonanalogous art and cannot be used to reject the claimed invention as obvious under 35 U.S.C. 103 (a). It is clearly from a different field since it does not involve making either a circuit board or IC. It is in the art of making tools for optical devices, i.e. the stamper, and this art is entirely different from the electronic arts. In addition, it is not reasonably relevant to the problem the invention is trying to solve, because laser erosion techniques are not used in any of the steps to make the stamper. Thus the problem of the invention does not occur with the method of Tabuchi.

For the foregoing reasons it is respectfully submitted that new claims 12 to 20 should not be rejected under 35 U.S.C. 102 (b) as anticipated by, or under 35 U.S.C. 103 (a) as obvious from, Tabuchi.

Claims 1 to 11 were rejected under 35 U.S.C. 102 (b) as anticipated by Ghezzo.

Claims 1 to 11 have been canceled, obviating their rejection under 35 U.S.C. 102 (b) based on Ghezzo. New independent claim 12 has been drafted so that it is patentably distinguishable from the disclosures in Ghezzo.

Ghezzo discloses a micro-mechanical electric switch and is generally concerned with the micro-manufacture of mechanical components. Ghezzo does disclose formation of cavities for switch contacts (claim 26) in a non-conductive polymeric dielectric layer 32 or non-conducting layers 34, 36 (Fig. 1, column 11, lines 9 to 14 and 30 to 35). These cavities are formed by laser ablation as disclosed at these locations. After formation of the cavities, a layer of gold 46 is applied by sputtering followed by a reinforcing electroplated layer 48.

However the improved device claimed in claim 12 is clearly distinguishable from the micro-mechanical switch of Ghezzo. In the case of applicants' claimed device, the claimed device includes contaminant conductive deposits produced by laser erosion. Material is removed from the conductive layers of the layer structure provided with thin-film technology on the substrate according to claim 12 in order to make an adjustment of an electronic component in the structure. This differs from the laser ablation in the device of Ghezzo because only non-conductive contaminants would be produced by the laser ablation in Ghezzo because the laser is only used to structure dielectric or non-conductive polymeric layers. Thus the disclosures in Ghezzo cannot anticipated claim 12 for this reason alone.

Furthermore, the thickness of the gold layer mentioned in column is greater than the upper limit of thickness for thin-film technology. Ghezzo teaches a structure with thick layers because the structure is intended to constitute a moving mechanical component. The structure disclosed is therefore different from the invention presently claimed in that it is significantly thicker than the

layers of the layer sequence of claim 12 built on the insulating substrate in thin film technology. It would not be possible to adjust these thick layers by laser erosion or ablation method used to adjust the layer sequence in thin-film technology because they are too thick.

Furthermore Ghezzo discloses providing a ferromagnetic layer 62 superposed on the gold layer before the sacrificial copper layer 82 is removed. This would preclude any adjustment by removal of thinner parts of the gold layer. Also Ghezzo does not disclose or suggest any adjustments of the thickness of the conductive layers before or after manufacture of the micro-mechanical switch, by laser ablation or any other means.

In summary, Ghezzo does not disclose (1) a substrate plus a laser sequence with contaminating conductive deposits thereof formed by the laser ablation and (2) does not disclose layers of a thickness that can be formed by thin-film technology; they are too thick. Also Ghezzo does not disclose (3) reducing the layer thickness of regions of the non-conductive layers removed by laser ablation prior to the laser ablation.

As noted above, each and every limitation of a claimed invention must be disclosed in a single prior art reference, in order to reject the claimed invention under 35 U.S.C. 102 (b) based on that prior art reference.

For the foregoing reasons it is respectfully submitted that new claims 12 to 20 should not be rejected under 35 U.S.C. 102 (b) as anticipated by, or under 35 U.S.C. 103 (a) as obvious from Ghezzo.

A response to the reasons for rejection of the original claims in the Office Action is obviated by their cancellation and filing of the new claims. The new claims do not rely on method-type features or intended use to distinguish them from the prior art.

APPENDIX SHOWING CHANGES MADE IN THE SPECIFICATION AND ABSTRACT TO OBTAIN THE REPLACEMENT PARAGRAPHS

Underlining shows additions; brackets show deletions

In the Abstract:

The following shows the changes in the abstract:

ABSTRACT OF THE DISCLOSURE

The layer sequence built on a substrate in [thin-layer] thin-film technology includes an electrically conductive sputtered layer [(4)] and an electrically conductive reinforcing layer [(5)] for reinforcing or strengthening the sputtered layer, which is applied on the sputtered layer by a method other than sputtering. In order to remove conducting material from the conductive layers with the aid of a laser for the purposes of adjustment while producing as little contaminating material as possible, the electrically conductive reinforcing layer [(5)] has a reduced thickness or is completely eliminated in regions [(6,10,14, 16, 17, 19)] of the electrically conductive layers [sputtered layer (4)] to be adjusted than in other regions outside of the regions to be adjusted.

In the Specification:

The following changes were made in the specification:

Page 4, second paragraph:

These objects, and others, which will be made more apparent hereinafter, are attained in a layer sequence built on a substrate in thin-film technology, said layer sequence comprising an electrically conductive sputtered layer, which is reinforced by a similar electrically conductive reinforcing layer, which is applied to the electrically conductive sputtered layer by another method, and at least one electronic component.

Page 4, last paragraph, running to page 5:

In a conventional layer sequence in [thin-layer] thin-film technology according to figure 1 an adherent sputtered layer 2 having a thickness of a few tens of nanometers is provided first on a substrate 1. Then a sputtered resistor layer 3 with a thickness of the same order of magnitude as the first sputtered adherent layer 2 is applied over it. Then similarly a gold sputtered layer 4 having a thickness in a range between about 200 nm and 400 nm is applied over the sputtered resistor layer 3. Finally an additional gold reinforcing layer 5, which was produced by galvanic deposition, chemical reinforcement or physically (for example by rolling on or spraying), having a thickness of about 2 to 10 micrometers was provided on the gold sputtered layer 4.

Page 8, third full paragraph (beginning about line 12):

While the invention has been illustrated and described as embodied in [a new] layer [sequence] sequences built on substrates in [thin-layer] thin-film technology, it is not intended to be limited to the details shown, since various modifications and changes may be made without departing in any way from the spirit of the present invention.

Should the Examiner require or consider it advisable that the specification, claims and/or drawing be further amended or corrected in formal respects to put this case in condition for final allowance, then it is requested that such amendments or corrections be carried out by Examiner's Amendment and the case passed to issue. Any costs involved should be charged to the deposit account of the undersigned (No. 19-4675). Alternatively, should the Examiner feel that a personal discussion might be helpful in advancing the case to allowance, he or she is invited to telephone the undersigned at 1-631-549 4700.

In view of the foregoing, favorable allowance is respectfully solicited.

Respectfully submitted,

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